

WHAT IS CLAIMED IS:

- 1 1. A method comprising the steps of:
 - 2 a) dispersing carbon nanotubes in a metal salt solution comprising a
 - 3 solvent; and
 - 4 b) removing the solvent to yield metal salt-treated carbon nanotubes.
- 1 2. The method of claim 1, wherein the carbon nanotubes are ground into a
- 2 powder prior to dispersing them in the metal salt solution.
- 1 3. The method of claim 1, wherein the metal salt is selected from the group
- 2 consisting of alkali metal salts, alkaline earth metal salts, transition metal salts, p-
- 3 block metal salts, rare earth metal salts, and combinations thereof.
- 1 4. The method of claim 1, wherein the metal salt is a cesium salt.
- 1 5. The method of claim 1, wherein the solvent is water.
- 1 6. The method of claim 1, further comprising a step of washing the metal salt-
- 2 treated carbon nanotubes.
- 1 7. The method of claim 1, further comprising a step of drying the metal salt-
- 2 treated carbon nanotubes.

- 1 8. A field emission apparatus comprising:
- 2 a) a low pressure gaseous environment; and
- 3 b) a cathode comprising:
- 4 i. a substrate; and
- 5 ii. a metal salt-treated carbon nanotube layer deposited on the
- 6 substrate.
- 1 9. The field emission apparatus of claim 8, wherein the metal salt is selected
- 2 from the group consisting of alkali metal salts, alkaline earth metal salts, transition
- 3 metal salts, p-block metal salts, rare earth metal salts, and combinations thereof.
- 1 10. The field emission apparatus of claim 8, wherein the metal salt is a cesium
- 2 salt.
- 1 11. The method of claim 8, wherein the metal salt-treated carbon nanotube layer
- 2 comprises a thickness which ranges from about 1 μm to about 10 μm .

- 1 12. A method for making a field emission cathode comprising the steps of:
- 2 a) providing a substrate; and
- 3 b) depositing metal salt-treated carbon nanotubes onto the substrate.
- 1 13. The method of claim 12, wherein the metal salt-treated carbon nanotubes
- 2 comprise an alkali metal salt.
- 1 14. The method of claim 12, wherein the metal salt-treated carbon nanotubes
- 2 comprise a cesium salt.
- 1 15. The method of claim 12, wherein the metal salt-treated carbon nanotubes
- 2 comprise carbon nanotubes selected from the group consisting of single-wall carbon
- 3 nanotubes, double-wall carbon nanotubes, multi-wall carbon nanotubes, carbon
- 4 fibrils, buckytubes, metallic carbon nanotubes, semi-conducting carbon nanotubes,
- 5 semi-metallic carbon nanotubes, chiral carbon nanotubes, chemically-modified
- 6 carbon nanotubes, capped carbon nanotubes, open-ended carbon nanotubes,
- 7 endohedrally-modified carbon nanotubes, and combinations thereof.
- 1 16. The method of claim 12, wherein the metal salt-treated carbon nanotubes are
- 2 deposited by a technique selected from the group consisting of spraying,
- 3 electrophoretic deposition, dipping, screen-printing, ink-jet printing, dispensing,
- 4 brushing, and combinations thereof.
- 1 17. The method of claim 12, wherein the metal salt-treated carbon nanotubes are
- 2 deposited by a technique comprising spraying solvent-dispersed metal salt-treated
- 3 carbon nanotubes onto the substrate.
- 1 18. The method of claim 17, wherein the substrate is heated during the deposition.
- 1 19. The method of claim 12, further comprising a step of reduction whereby at
- 2 least some of the metal salt is reduced to metal.

- 1 20. The method of claim 12, further comprising a step of tape activation.